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ENHANCING QUALITY OF TEACHING LEARNING BY USING INFORMATION AND COMMUNICATION TECHNOLOGY (ICT)

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Abstract

During the past few years, Information and Communication Technology (ICT) has changed our daily activities in many ways. The ICT has revolutionized teaching–learning process. One of the goals for integrating ICTs in education is to enhance teaching-learning practices there by improving quality of education. Considering that ICT plays an increasingly important role in society, especially if we take into account social, economic and cultural role of computers and Internet, it is clear that the time has come for the actual entry of ICT in the field of education. The combination of ICT and the internet certainly opens not only many opportunities for creativity and innovation, but also for approaching the teaching material to current generation of students. Technology saves time and gives students access to powerful new ways to explore concepts at a depth that has not been possible in the past. The growth of these communication and computer systems, their ease of use, the power and diversity of information transfer allow teachers and students to have access to a world beyond the classroom also interact with each other over a world geographic distance in a meaningful way to achieve the learning objectives. It has the potential to transform the nature and process of the learning environment and envision a new learning culture. Interactively, flexibility and convenience have become the order of the day in the ICT supported environment. ICT helps the learner to share learning resources and spaces, promote learner centered and collaborative learning principles and enhance critical thinking, creative thinking and problem solving skills. ICT based education is definitely the direction towards which the whole world is progressing.

Keywords: *ICT, Education, Teaching-Learning, Technology, Computer.*

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Introduction: The twenty first century is knowledge and information revolution century. Technology will have a critical role in 21st century (Alinston, 2002). Modern civilization is characterized by the growing pace of change. It is because of the enormous difficulty in understanding, appreciating and even surviving change that we talk about the impact of these changes as future shock. ICT is the fusion of computers and the telecommunications. Computers enable people to work creatively. But they are limited by what they can access. Adding a communications channel, such as the internet or other information services, significantly extends the capability of the computer. It can also become a means of obtaining education, information and working creatively with others irrespective of geographical barriers (Pathak & Chaudhury, 2012). ICT is that technology which uses the information to meet human need or purposes including processing and exchanging. Certainly, the leadership of future education will be assumed by ICT. ICT in education is the processing of information and its communications facilities and features that variously support teaching, learning and a range of activities in education (Webb & Cox, 2004). In the era of computer technology the term ICT mainly focuses on the infrastructure, devices and sources of computer technology and thus it is imperative to discuss about the use of ICT in education by focusing mainly on computer based technology. ICTs have the potential to accelerate, enrich, and deepen skills, to motivate and engage students, to help relate school experience to work practices, create economy viability for tomorrow's workers as well as strengthening teaching-learning process (Yusuf, 2005). The integration of information and communication technologies can help revitalize teachers and students. This can help to improve and develop the quality of education by providing curricular support in difficult subject areas.

Concept and Nature of ICT: Information and communication technology (ICT) refers to the creation, gathering, processing, storage, presentation and determination of information and also the process and devices that enable all this to be done. Information manifests itself wherever and whenever we find or create any patterns. Information should be meaningful, surprising and new, in conformity and linked with previous knowledge, correction of previous knowledge, accurate, updated and action oriented. When ideas, emotions, experiences and information are exchanged between two or more persons it is referred as

communication. Technology plays an important role in transforming data to information, to knowledge and into wisdom (Kozma, 2005).

ICT in education is any information Technology that focuses on the acquisition, storage, manipulation, management, transmission or reception of data required for the educational purpose (Yuen et. al., 2005). As for example, the information about students' records, their admission, updates of their curricular and co-curricular activities. ICT in education refers any educational technology that deals with the exchange of information or in other words communication in the teaching-learning process. It encompasses hardware approach like use of machine and materials software approach like use of methodologies and strategies of teaching–learning and system approach that uses the management technology that deals with the systematic organization of the hardware and the software (Harris, 2002). ICT enables teachers and students to construct rich multi-sensory, interactive environments with almost unlimited teaching and learning potential.

Uses of ICT in Education: Modern society is becoming too intricate as well as education has become increasingly complex, with more and more information communicated to the student. In creating this new teaching-learning environment, ICT offers numerous contributions to increase the interaction and reception of information. ICT is being utilized in every part of life. Learning approaches using contemporary ICTs provide many opportunities for constructivist learning through their provision and support for resource based, student centered settings and by enabling learning to be related to context and to practice (Berge, 1998; Barron, 1998). Education even at school stage has to provide computer instruction. Profound technical knowledge and positive attitude towards this technology are the essential prerequisites for the successful citizens of the coming decades. ICT can be used for the following purposes-

To broadcast material, online facility or CD-ROM can be used as sources of information in different subjects;

To facilitate communication for pupils with special needs;

To use electronic toys to develop spatial awareness and psychomotor control;

To use the online resource like, e-mail, chat, discussion forum to support collaborative writing and sharing of information;

To facilitate video-conference or other form of teleconferences for exchange the ideas , information and working creatively with others from distant geographic areas;

For blended learning by combining conventional classroom learning with E-learning systems;
To process administrative and assessment data;
To exchange and share ideas-among teachers for the professional growth;
To carry out internet based research work to enhance educational process.

Advantages of the use of ICT in Education: ICT encompasses all those gadgets that deal with the processing of information for better and effective communication. The use of ICT creates a powerful learning environment and it transforms the learning and teaching process in which students deal with knowledge in an active, self-directed and constructive way (Volman & Van Eck, 2001). ICT is not just regarded as a tool, which can be added to or used as a replacement of existing teaching methods. ICT is seen as an important instrument to support new ways of teaching and learning. It should be used to develop student's skills for co-operation, communication, problem solving and lifelong learning (Plom et. al., 2003). In this context, advantages of ICT in education can be listed down as follows-

Information can be accessed in seconds by connecting to the internet and surfing through web pages.

There are no geographical boundaries for it, it caters to need-based education, provides specialized and comprehensive knowledge.

ICT can contribute in catering individual needs of the students as per their capabilities and interest.

There are no interruptions in work, lifelong education is possible, communication is easier and faster and awareness of new knowledge is developed through ICT.

The syllabus can be individualized; it develops discipline systematically and neatly.

Sitting at home or at any comfortable place the desired information can be accessed easily that helps teachers as well as students.

Students can evaluate their own progress through different quizzes, online test or off line test.

ICT enhances wider range of communication media with advent of ICT, different means of communication are being introduced in the teaching learning process.

ICT enables teachers and students to construct rich multi-sensory, interactive environments with almost unlimited teaching and learning potential.

ICT shall also change age and gender distribution and opportunities in the workplace. Men and women and young people can learn to use ICT and work in its environments.

Factors affecting ICT Learning

Teacher-level barriers

Lack of time-for both formal training and self-directed exploration,

Preparing ICT resources for lesson,

Lack of self-confidence in using ICT,

Negative experiences with ICT in the past,

Fear of embarrassment in front of pupils and colleagues, loss of status and an effective degrading of professional skills,

Classroom management difficulties when using ICT, especially where pupil –to-computer ratios are poor,

Lack of the knowledge necessary to enable teachers to resolve technical problems when they occur,

Lack of personal change management skills,

Perception that technology does not enhance learning,

Lack of motivation to change long-standing pedagogical practices,

Perception of computers as complicated and difficult to use.

School–level barriers

Lack of ICT equipment and the cost of acquiring, using and maintaining ICT resources.

Lack of access to ICT equipment due to organizational factors such as the deployment of computers in ICT suites rather than classrooms.

Lack of technical support.

Lack of administrative support.

Lack of institutional support through leadership, planning and the involvement of teachers as well as managers in implementing change.

Lack of training focusing on integrating technology in the classroom rather than simply teaching basic skills.

Attitudes: Attitudes towards ICT, therefore, can be barriers in themselves and can influence or be influenced by other barriers. Although attitudes partly depend on personality, the importance of previous computer experience is widely recognized (Butler & Sellbom, 2002). Negative experiences affect perceptions of the ease of use and relevance of ICT, reducing confidence and increasing anxiety. Computer anxiety and anxiety about change are key factors limiting teachers' use of technology.

Training: ICT training can help overcome barriers, yet many authors argue that it often fails to do so. While a lack of time and training are major obstacles, research suggests there are

weakness in the design and delivery of many courses (Lim & Chai, 2004). By focusing on basic ICT skill, training fails to prepare teachers to integrate ICT in their pedagogy.

Factors facilitating ICT learning

Pedagogical objectives and goals: The research on educational innovation suggests that it is important for schools to share a reformed vision of teaching and learning in order to create sustainable change at the school and classroom levels. Present education system is moving away from a traditional system based on memorization and testing to support a more student centered approach to teaching and learning with ICT. This change is expressed in the state curricular frame works that are often difficult to translate into practice (Rampal, 2002).

Leadership: The research literature also indicates that leadership at various levels of the system is important if an innovative project is to take root and grow at the classroom level (Cholin, 2005). Most of these schools function with two levels of leadership-first there is the national or provincial ministry of education that sets overall policy, curricula and national assessment; secondly, there is the building leadership that makes the day-to-day decisions (Yuen et. al., 2005).

Professional development and on-going support: For much the same reasons that supportive leadership is important in helping teachers innovate, ongoing professional development also appears to be a critical factor. In the context of education reform, the tools and teaching strategies are new to many of the teachers; therefore, both the quality of the professional development courses and the presence of ongoing support for teachers in their classrooms are important (Kozma, 2005). Research suggests that teachers must be offered multiple points of entry into practices supporting ICT use and student centered teaching.

Experimentation, adaption and critical reflection: Research literature's perspective offers an interesting insight on the importance of experimentation for ICT integration and education reform. Findings reveal that the role a culture of experimentation plays in school-wide change and its relationship to leadership, pedagogical goals, and professional development (Pelgrum, 2001). Educators usually exhibit a willingness to experiment and take on the challenges of trying to do new things. If professional development provides teachers access to information about new tools and practices, there will be a willingness to experiment with novel ideas, and openness to reflect on the successes and failures, in order to create positive changes (Harris, 2002). In these schools, the culture of experimentation is promoted by the leadership and is in line with each school's pedagogical goals.

Time: Much like a physical resource, time is a scarce resource that schools must manage carefully. Time in relation to ICT implementation has to be viewed in two dimensions: i) teachers' professional development and planning time and ii) students' time in the classroom or learning activity. Each school should develop their own strategies for training teachers and implementing the use of ICT depending on the particularities of the larger system (Mooji, 2007).

ICT infrastructure: In most developing countries, ICT infrastructure also is commonly a limited resource in schools. With limited resources, it is often difficult for schools to provide sufficient access so students can use ICT during their classes. Research studies suggest that no single strategy will work for all schools with resource limits. Instead, each school developed unique strategies to provide meaningful learning activities using ICT tools, whether it was teachers using ICT-based teaching aids or student ICT use (Barron, 1998). Although many urban Indian schools have computer labs, there are still too many students to give class consistent and frequent ICT access during the school day. Thus, the schools in India need to work on strategies to make facilities available to both students and teachers during school hours.

Financing and sustainability: Costs and sustainability are ongoing challenges for all of these schools when attempting to bring in new, complex resources such as ICT (Lim & Chai, 2004). These schools attempt to do two things to manage sustainability of their ICT activities: first, they try to obtain resources from as many sources as possible, and second, they try to control the costs related to ICT activities.

ICT and Teaching-Learning Process

ICT enhancing Teaching-Learning Process

The main consideration of ICT based education is the improvement of the teaching-learning process. The integration of information and communication technologies can help revitalize teachers and students. This can help to improve and develop the quality of education by providing curricular support in difficult subject areas. Teachers need to be involved in collaborative projects and development of invention change strategies, which would include teaching partnerships with ICT as a tool. Contemporary learning theory is based on the notion that learning is an active process of constructing knowledge rather than acquiring knowledge and that instruction is the process by which this knowledge construction is supported rather than a process of knowledge transmission (Jonassen & Reeves, 1996). In this domain

learning is viewed as the construction of meaning rather than as the memorization of facts (Lebow, 1993). Learning approaches using contemporary ICTs provide many opportunities for constructivist learning through their provision and support for resource-based, student centered settings and by enabling learning to be related to context and to practice (Berge, 1998). Teachers generate meaningful and engaging learning experiences for their students, strategically using ICT to enhance learning. Students enjoy learning and the independent enquiry which innovative and appropriate use of ICT can foster. They begin to acquire the important 21^{st} century skills which they will need in their future lives.

ICT Enhancing the Quality and Accessibility of Education: ICT increases the flexibility of delivery of education so that learners can access knowledge anytime and from anywhere. It can influence the way students are taught and how they learn as now the processes are learner driven and not by teachers. This in turn would better prepare the learners for lifelong learning as well as to improve the quality of learning. In concert with geographical flexibility, technology-facilitate educational programs also many of the temporal constraints that face learners with special needs (Moore & Kearsley, 1996). Students are starting to appreciate the capability to undertake education anywhere, anytime and anyplace. One of the most vital contributions of ICT in the field of education is easy access to learning. With the help of ICT, students can now browse through e-books, sample examination papers, previous year papers etc. and can also have an easy access to resource persons, mentors, experts, researchers, professionals and peers all over the world. This flexibility has heightened the availability of just-in-time learning and provided learning opportunities for many more learners who previously were constrained by other commitments (Young, 2002). Wider availability of best practices and best course material in education, which can be shared by means of ICT, can foster better teaching. ICT also allows the academic institutions to reach disadvantaged groups and new international educational markets. As well as learning at any time, teachers are also finding the capabilities of teaching at any time to be opportunistic and able to be used to advantage. Thus, ICT enabled education will ultimately lead to the democratization of education. ICT has the potential to remove the barriers that are causing the problems of low rate of education in any country. It can be used as a tool to overcome the issues of cost, less number of teachers, and poor quality of education as well as to overcome time and distance barriers (Mc Gorry, 2002).

ICT Enhancing Learning Environment: ICT presents an entirely new learning environment for students, thus requiring a different skill set to be successful. Critical

thinking, research and evaluation skills are growing in importance as students have increasing volumes of information from a variety of sources to sort through (Jonassen, 1999). ICT is changing processes of teaching and learning by adding elements of vitality to learning environments including virtual environments for the purpose. ICT is a potentially powerful tool for offering educational opportunities. It is difficult and may be even impossible to imagine future learning environments that are not supported, in one way or another by ICT. ICT provides opportunities to access an abundance of information using multiple information resources and viewing information from multiple perspectives, thus fostering the authenticity of learning environments. ICT may also make complex processes easier to understand through simulations that again contribute to authentic learning environments. Thus, ICT may function as a facilitator of active learning and higher order thinking (Alexander, 1999). The use of ICT may foster co-operative learning and reflection about the content (Susman, 1998). ICT environment improves the experience of the students and teachers and to use intensively the learning time for better results. The ICT environment has been developed by using different software and also extended experience in developing web based and multimedia materials. ICTs have an important role to play in changing and modernizing educational systems and ways of learning.

ICT Enhancing Learning Motivation: ICTs can enhance the quality of education in several ways by increasing learner motivation and engagement, by facilitating the acquisition of basic skills and by enhancing teacher training. ICTs are also transformational tools which can promote learner centered environment. ICTs, especially computers and internet technologies enable new ways of teaching and learning rather than simply allow teachers and students to do what they have done before in a better way. ICT has an impact not only on what students should learn but it also plays a major role on how the students should learn (Girasoli and Hannafin, 2008). Unlike static, text or print based educational technologies, ICT enhanced learning recognizes that there are many different learning pathways and many different articulations of knowledge. ICTs allow learners to explore and discover rather than merely listen and remember. The World Wide Web (WWW) also provides a virtual international gallery for students' work. ICT can engage and inspire students, and this has been cited as a factor influencing ready adaptors of ICT (Long, 2001).

ICT Enhancing Scholastic Performance: Based on the extensive usage of ICTs in education the need appeared to unravel the myth that surrounds the use of information and communication technology (ICT) as an aid to teaching and learning, and the impact it has on

students' academic performance. ICTs are said to help expand access to education, strengthen the relevance of education to the increasingly digital workplace, and raise educational quality. However, the experience of introducing different ICTs in the classroom and other educational settings all over the world over the past several decades suggests that the full realization of the potential educational benefits of ICT. The direct link between ICT use and students' academic performance has been the focus of extensive literature during the last two decades. ICT helps students to their learning by improving the communication between them and the instructors (Valasidou & Bousiou, 2005). The analysis of the effects of the methodological and technological innovations on the students' attitude towards the learning process and on students' performance seems to be evolving towards a consensus, according to which an appropriate use of digital technologies in education can have significant positive effects both on students' attitude and their achievement.

Conclusion: ICT for education refers to the development of information and communication technology specifically for teaching-learning process, while the ICTs in education involve the adoption of general components of information and communication technologies in the teaching-learning process. This paper has sought to explore the role of ICT in education as we progress in to the 21st century. In particular ICTs have impacted on educational practice in education to date in quite small ways but that the impact will grow considerably in years to come and that ICT will become a strong agent for change among many educational practices. Extrapolating current activities and practices, the continued use and development of ICTs within education will have a strong impact on ICT and teaching learning process, quality and accessibility of education, learning motivation, learning environment and ICT usage and academic performance. The adoption and use of ICTs in education have a positive impact on teaching, learning and research. ICT can affect the delivery of education and enable wider access to the same. In addition, it will increase flexibility so that learners can access to the same. In addition, it will increase flexibility so that learners can access the education regardless of time and geographical barriers. It can influence the way students are taught and how they learn. It would provide the rich environment and motivation for teaching learning process which seems to have a profound impact on the process of learning in education by offering new possibilities for learners and teachers. These possibilities can have an impact on student performance and achievement. Similarly wider availability of best practices and best course material in education, which can be shared by means of ICT, can foster better teaching

and improved academic achievement of students. The overall literature suggests that successful ICT integration in education.

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